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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT PAPER NUMBER

2871

DATE MAILED: 11/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/741,330

Applicant(s)

MATSUYAMA ET AL.

Examiner

Prasad R Akkapeddi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 2,3 and 13 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 2 recites the limitation "said surfaces" in claim 1. There is insufficient antecedent basis for this limitation (plural) in the claim.

4. Claims 2 and 3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention: the recited limitation 'a black matrix layer is formed below said underlying layer to a thickness with which said black matrix layer protrudes from a surface of said color filter corresponding to said pixel electrode' and 'overlapped edge portions have a thickness with which said overlapped edge portions have a thickness with which said overlapped edge portion protrudes from a surface of said color filter' is unclear and indefinite because the thickness is not defined properly.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 1, 6-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Kume et al. (Kume) (U.S. Patent No. 6,115,098).

As to claim1: Kume discloses a liquid crystal display device with a pixel electrode substrate (1) including pixel electrodes (6), active elements (TFT, Col. 15, line 7), color filters (not shown, Col. 11, line 22) and a first alignment layer (5b) covering the pixel electrodes, the active elements the said color filters, an opposing substrate (2) including a common electrode (4) and a second alignment layer (5a) covering the common electrode (4) and opposing to the alignment layer of pixel electrode substrate (1), a liquid crystal layer (8) disposed between the first and second alignment layers (5a and 5b), wiring patterns (Fig. 4b) related to the active elements of the pixel electrode substrate and arranged around pixel electrodes (6) and protrusions (Fig. 4A) protruding from a surface of

the pixel electrodes toward the common electrode (4) and extending along the wiring patterns to form slopes (Fig. 4A), the liquid crystal layer being controlled such that in an initial orientation of liquid crystal layer, orientation of liquid crystal molecules of the liquid crystal layer is divided to a plurality of orientations by the slopes (Fig. 4A).

As to claims 6-8: Kume discloses that the active elements are thin film transistors (Col. 25, line 7), the transparent electrode films (3) of the pixel electrodes (6) are separated from slopes of the protrusions surrounding the pixel electrodes (Fig. 4A) and the liquid crystal molecules of the liquid crystal layer have a negative dielectric anisotropy (Col. 15, line 48).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kume in view of Kuo (U.S. Patent No. 6,424,397).

a. As to claim 4: Kume discloses in Fig. 4 that the slopes are parabolic and the relationship of the slope tilt angle to the height and length (From Fig. 4 one can see that the height is about 5 arbitrary units and the length is about 10 arbitrary units thus making the angle more than 11 degrees) and the ratio of the

gaps can be calculated from this figure. Again, Kuo also discloses that the protrusion angles are between 1- 89 degrees (Col. 17, lines 61-62). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to calculate slope angle and the gap ratios.

9. Claims 5, 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kume in view of Kuo (U.S. Patent No. 6,424,397).

b. As to claims 5, 9-10: Although Kume discloses that the protrusions are formed on the pixel substrate (1) where the color filter and black matrix are also located, Kume does not disclose that the protrusions can also be formed on the common electrode substrate. Kuo on the other hand, in disclosing a similar wide viewing angle liquid crystal display (Fig. 4E), discloses protrusions (418) in the common electrode (416 a,b) substrate (402) that extend toward the pixel electrode substrate (400), electrode openings. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the electrode openings and the corresponding slopes as disclosed by Kuo to the liquid crystal device disclosed by Kume to enhance the wide angle viewing capability for these liquid crystal displays.

10. Claims 11-12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kume in view of Kuo.

Kume discloses a method of making a liquid crystal display (Col. 27 and 28). Kume however, does not explicitly disclose a method of forming the color filters on the pixel substrate (Kume mentions the use of color filters in Col. 11,

line 22). The filling of the gaps between the color filters by the black matrix is very well known. Kume also discloses the black matrix (Col. 11, line 12). Kume also discloses the initial orientation control such that liquid crystal molecules on the pixel electrodes between the opposing substrate and the pixel electrode substrate vertically toward the slopes (Col. 12, lines 32-51) and the orientation of the molecules with applied voltage (Col. 12, lines 32-36). Kuo also discloses a method of forming a wide viewing angle liquid crystal display device with color filters on the common substrate side. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the method of fabricating the device as disclosed by Kuo to the liquid crystal device disclosed by Kume to enhance the wide angle viewing capability for these liquid crystal displays and to make the device feasible.

Allowable Subject Matter

11. Claims 2-3 and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: A search of the prior art did not reveal that

(a). The black matrix layer protrudes from a surface of the color filter corresponding to the pixel electrode


(b) The edge portions of adjacent ones of the color filters are overlapped such that the overlapped edge portions have a thickness that protrudes from a surface of the color filters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

November 26, 2002


ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2000